<110> ITOH, Kyogo et al.

<120> NOVEL TUMOR ANTIGEN PROTEIN ART-1 AND TUMOR ANTIGEN PEPTIDES THEREOF

<130> 0020-4872P

<140> US 09/857,308
<141> 2001-06-01

<150> Japan: 98-341253
<151> 1998-12-01

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Thr Asn Arg Ser Ser Phe Asp Leu Leu Pro Arg Glu Phe Arg Leu Val
            20                  25                  30
Glu Val His Asp Pro Pro Leu His Gln Pro Ser Ala Asn Lys Pro Lys
        35                  40                  45
Pro Pro Thr Met Leu Asp Ile Pro Ser Glu Pro Cys Ser Leu Thr Ile
    50                  55                  60
His Thr Ile Gln Leu Ile Gln His Asn Arg Arg Leu Arg Asn Leu Ile
65                  70                  75                  80
Ala Thr Ala Gln Ala Gln Asn Gln Gln Thr Glu Gly Val Lys Thr
            85                  90                  95
Glu Glu Ser Glu Pro Leu Pro Ser Cys Pro Gly Ser Pro Pro Leu Pro
            100                 105                 110
Asp Asp Leu Leu Pro Leu Asp Cys Lys Asn Pro Asn Ala Pro Phe Gln
        115                 120                 125
Ile Arg His Ser Asp Pro Glu Ser Asp Phe Tyr Arg Gly Lys Gly Glu
    130                 135                 140
Pro Val Thr Glu Leu Ser Trp His Ser Cys Arg Gln Leu Leu Tyr Gln
145                 150                 155                 160
Ala Val Ala Thr Ile Leu Ala His Ala Gly Phe Asp Cys Ala Asn Glu
            165                 170                 175
Ser Val Leu Glu Thr Leu Thr Asp Val Ala His Glu Tyr Cys Leu Lys
            180                 185                 190
Phe Thr Lys Leu Leu Arg Phe Ala Val Asp Arg Glu Ala Arg Leu Gly
        195                 200                 205
Gln Thr Pro Phe Pro Asp Val Met Glu Gln Val Phe His Glu Val Gly
    210                 215                 220
Ile Gly Ser Val Leu Ser Leu Gln Lys Phe Trp Gln His Arg Ile Lys
225                 230                 235                 240
Asp Tyr His Ser Tyr Met Leu Gln Ile Ser Lys Gln Leu Ser Glu Glu
            245                 250                 255
Tyr Glu Arg Ile Val Asn Pro Glu Lys Ala Thr Glu Asp Ala Lys Pro
            260                 265                 270
Val Lys Ile Lys Glu Glu Pro Val Ser Asp Ile Thr Phe Pro Val Ser
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1

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                275                    280                    285
      Glu Glu Leu Glu Ala Asp Leu Ala Ser Gly Asp Gln Ser Leu Pro Met
            290                    295                    300
      Gly Val Leu Gly Ala Gln Ser Glu Arg Phe Pro Ser Asn Leu Glu Val
      305                    310                    315                    320
      Glu Ala Ser Pro Gln Ala Ser Ser Ala Glu Val Asn Ala Ser Pro Leu
                          325                    330                    335
      Trp Asn Leu Ala His Val Lys Met Glu Pro Gln Glu Ser Glu Glu Gly
                    340                    345                    350
      Asn Val Ser Gly His Gly Val Leu Gly Ser Asp Val Phe Glu Glu Pro
                    355                    360                    365
      Met Ser Gly Met Ser Glu Ala Gly Ile Pro Gln Ser Pro Asp Asp Ser
            370                    375                    380
      Asp Ser Ser Tyr Gly Ser His Ser Thr Asp Ser Leu Met Gly Ser Ser
      385                    390                    395                    400
      Pro Val Phe Asn Gln Arg Cys Lys Lys Arg Met Arg Lys Ile
                          405                    410
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cagcagtgaa tagtgtggta cctccttgtc tcggttcagg tccagacctc cccgtcttcc        120
ggctgccctg aacgtcaggc gacctcagga ccctgtgatt ggcgcctgcg ccggcggacc        180
gtgaccgagg aaacccctgg agggacttgg gcattccttg ggctccgtgc ctgttcttcg        240
tgctcctttc gggcaaggat ctcacattat cagtctttga ccgacacaga atgcctggca        300
tttgataaat gtttgttgaa cttgaagaga catatggaca atg aat ctg caa aga         355
                                                 Met Asn Leu Gln Arg
                                                                    5

tac tgg gga gag ata cca ata tca tca agc cag acc aac aga agt tcc         403
Tyr Trp Gly Glu Ile Pro Ile Ser Ser Ser Gln Thr Asn Arg Ser Ser
                   10                      15                  20

ttc gat ttg ctc cca cgg gag ttc cgt ctg gtg gaa gtc cat gac cca         451
Phe Asp Leu Leu Pro Arg Glu Phe Arg Leu Val Glu Val His Asp Pro
               25                      30                  35

ccc ctg cac caa ccc tca gcc aac aag ccg aag ccc ccc act atg ctg         499
Pro Leu His Gln Pro Ser Ala Asn Lys Pro Lys Pro Pro Thr Met Leu
           40                      45                  50

gac atc ccc tca gag cca tgt agt ctc acc atc cat acg att cag ttg         547
Asp Ile Pro Ser Glu Pro Cys Ser Leu Thr Ile His Thr Ile Gln Leu
   55                      60                  65

att cag cac aac cga cgt ctt cgc aac ctt att gcc aca gct cag gcc         595
Ile Gln His Asn Arg Arg Leu Arg Asn Leu Ile Ala Thr Ala Gln Ala
70                      75                  80                      85

cag aat cag cag cag aca gaa ggt gta aaa act gaa gag agt gaa cct         643
Gln Asn Gln Gln Gln Thr Glu Gly Val Lys Thr Glu Glu Ser Glu Pro
                   90                      95                  100

ctt ccc tcg tgc cct ggg tca cct cct ctc cct gat gac ctc ctg cct         691
Leu Pro Ser Cys Pro Gly Ser Pro Pro Leu Pro Asp Asp Leu Leu Pro
                   105                     110                 115

tta gat tgt aag aat ccc aat gca cca ttc cag atc cgg cac agt gac         739
Leu Asp Cys Lys Asn Pro Asn Ala Pro Phe Gln Ile Arg His Ser Asp
           120                     125                 130

cca gag agt gac ttt tat cgt ggg aaa ggg gaa cct gtg act gaa ctc         787
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2

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Pro Glu Ser Asp Phe Tyr Arg Gly Lys Gly Glu Pro Val Thr Glu Leu
    135                 140                 145
agc tgg cac tcc tgt cgg cag ctc ctc tac cag gca gtg gcc aca atc        835
Ser Trp His Ser Cys Arg Gln Leu Leu Tyr Gln Ala Val Ala Thr Ile
150                 155                 160                 165
ctg gcc cac gcg ggc ttt gac tgt gct aat gag agt gtc ctg gag acc        883
Leu Ala His Ala Gly Phe Asp Cys Ala Asn Glu Ser Val Leu Glu Thr
                170                 175                 180
cta act gat gtg gca cat gag tat tgc ctt aag ttt acc aag ttg ctg        931
Leu Thr Asp Val Ala His Glu Tyr Cys Leu Lys Phe Thr Lys Leu Leu
                185                 190                 195
cgt ttt gct gtg gac cgg gag gcc cgg ctg gga cag act cct ttt cct        979
Arg Phe Ala Val Asp Arg Glu Ala Arg Leu Gly Gln Thr Pro Phe Pro
            200                 205                 210
gat gtg atg gag cag gta ttc cat gaa gtg ggt att ggc agt gtg ctc       1027
Asp Val Met Glu Gln Val Phe His Glu Val Gly Ile Gly Ser Val Leu
            215                 220                 225
tcc ctc cag aag ttc tgg cag cac cgc atc aag gac tat cac agt tac       1075
Ser Leu Gln Lys Phe Trp Gln His Arg Ile Lys Asp Tyr His Ser Tyr
230                 235                 240                 245
atg cta cag att agt aag caa ctc tct gaa gaa tat gaa agg att gtc       1123
Met Leu Gln Ile Ser Lys Gln Leu Ser Glu Glu Tyr Glu Arg Ile Val
                250                 255                 260
aat cct gag aag gcc aca gag gac gct aaa cct gtg aag atc aag gag       1171
Asn Pro Glu Lys Ala Thr Glu Asp Ala Lys Pro Val Lys Ile Lys Glu
                265                 270                 275
gaa cct gtg agc gac atc act ttt cct gtc agt gag gag ctg gag gct       1219
Glu Pro Val Ser Asp Ile Thr Phe Pro Val Ser Glu Glu Leu Glu Ala
            280                 285                 290
gac ctt gct tct gga gac cag tca ctg cct atg gga gtg ctt ggg gct       1267
Asp Leu Ala Ser Gly Asp Gln Ser Leu Pro Met Gly Val Leu Gly Ala
            295                 300                 305
cag agc gaa cgc ttc cca tct aac ctg gag gtt gaa gct tca cca cag       1315
Gln Ser Glu Arg Phe Pro Ser Asn Leu Glu Val Glu Ala Ser Pro Gln
310                 315                 320                 325
gct tca agt gca gag gta aat gct tct cct ctt tgg aat ctg gcc cat       1363
Ala Ser Ser Ala Glu Val Asn Ala Ser Pro Leu Trp Asn Leu Ala His
                330                 335                 340
gtg aaa atg gag cct caa gaa agt gaa gaa ggc aat gtc tct ggg cat       1411
Val Lys Met Glu Pro Gln Glu Ser Glu Glu Gly Asn Val Ser Gly His
                345                 350                 355
ggt gtg ctg ggc agt gat gtc ttc gag gag cct atg tca ggc atg agt       1459
Gly Val Leu Gly Ser Asp Val Phe Glu Glu Pro Met Ser Gly Met Ser
                360                 365                 370
gaa gct ggg att cct cag agc cct gat gac tca gat agc agc tat ggt       1507
Glu Ala Gly Ile Pro Gln Ser Pro Asp Asp Ser Asp Ser Ser Tyr Gly
                375                 380                 385
tcc cac tcc act gac agc ctc atg ggg tcc tcc cct gtt ttc aac cag       1555
Ser His Ser Thr Asp Ser Leu Met Gly Ser Ser Pro Val Phe Asn Gln
390                 395                 400                 405
cgc tgc aag aag agg atg agg aaa ata taaaaggaaa agagggagat            1602
Arg Cys Lys Lys Arg Met Arg Lys Ile
                410
gttttgtcca gacctactag acccaacaga aaaggttttt gtattagaat ctgtttcctt   1662
aaaaattgat ttgactcctg ttcttaaaaa aaaaaaaaaa aaaaaaaaa               1711

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Leu Tyr Gln Ala Val Ala Thr Ile
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Pro Phe Pro Asp Val Met Glu Gln Val Phe
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Lys Phe Thr Lys Leu Leu Arg Phe
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Thr Phe Pro Val Ser Glu Glu Leu
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B6
Concludes